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Responsibilities to Address O and M Considerations in the Construction Grants Process: Instructor's Manual

Texas A and M Univ., College Station

Prepared for

National Training and Operational Technology Center, Cincinnati, OH

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Designed for a 1 day workshop on O & M Considerations in the construction grants process, this manual outlines procedures in the USEPA Construction Grants Program which should be taken by local officials to assure that operation and maintenance are given full attention throughout the Construction Grants Process. Contents include lesson plans, references to handout sheets and the use of slides.

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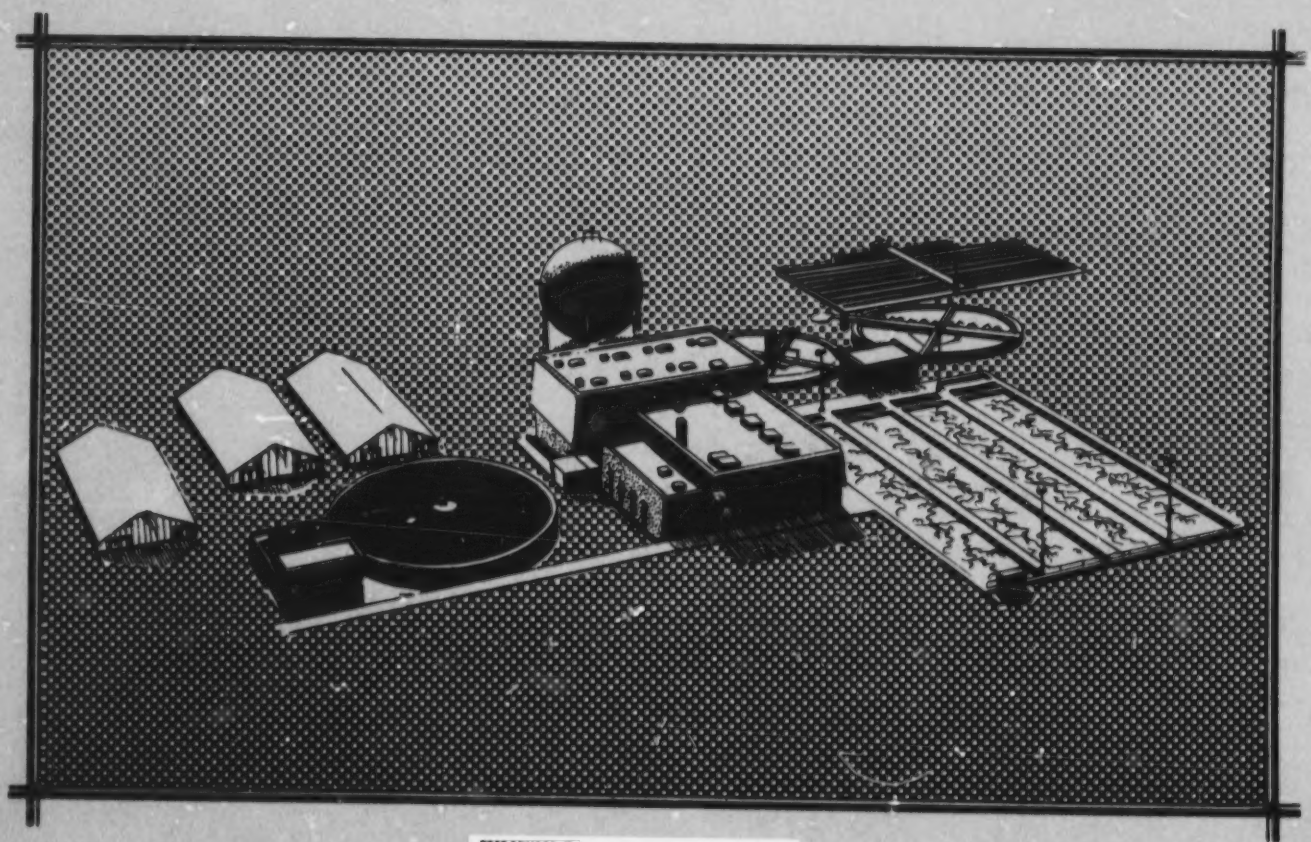

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RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

INSTRUCTOR'S MANUAL

Prepared for:

Environmental Protection Agency
Cincinnati, Ohio 45268

Under Training Grant No. T-901-051-010

by

Water and Wastewater Training Division

In cooperation with

Vocational Industrial Teacher Education Division

Texas Engineering Extension Service
The Texas A&M University System
College Station, Texas 77843

DISCLAIMER

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Texas Engineering Extension Service

James R. Bradley, Director

Water and Wastewater Training Division

Clark Benson, Head
Project Director

Leon Holbert
Consultant

Dan D. Siebeneicher
Technical Writer

Catherine L. Mieth
Typist

Vocational Industrial Teacher Education Division

Dr. M. Doyle Butler, Head

Daniel N. Gray, Coordinator
Instructional Materials Services

Toni M. Dean
Instructional Materials Specialist

William E. Medcalf
Instructional Materials Specialist

Stephen E. Presnal
Audio Visual Specialist

Instructional Programs Services

Steve Shiller, Head

Al Posey
Barbara Sexton
Publications

Elaine Merrifield
Bonnie Wilkinson
Editors

Vickie Clakley
Debbie Marsh
Word Processors

Lori Grassman
Artist

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INTRODUCTION

The Water Production Control Act (P.L. 84-660) was passed by Congress in 1956, and amended in 1972 (P.L. 92-500). In 1977 the Clean Water Act (P.L. 92-217) was passed. These laws provide for extensive involvement and support by the federal government in local, state, and area-wide wastewater treatment systems. The Environmental Protection Agency (EPA) has the responsibility of implementing these laws.

Over the past 25 years about 20 billion dollars in federally funded construction grants programs have been spent to build new wastewater treatment facilities. It is estimated that nearly 50 percent of these facilities are not meeting their original design objectives. This continuing trend of poor performance must be corrected if point source pollution is to be controlled.

A variety of factors contribute to this trend of poor performance. This course of study: (1) addresses these factors, (2) describes specific steps that should be followed by EPA and state agency personnel throughout the technical and procedural review process, and (3) provides the necessary guidelines for increasing EPA's and the state agency's effectiveness in implementing O&M concerns in the Construction Grants Process.

INTRODUCTION

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FOREWORD

The Instructor's Manual is designed as a guide for teachers of the one-day training workshop entitled, "Responsibilities to Address O&M Considerations in the Construction Grants Process" EPA-4301/1-80-09 May 1981.

This training program has been developed for appropriate representatives of municipalities who have received Step 1 Grants under Title II of the Clean Water Act. It will focus on the motivation of Step 2 Grantees to address operational requirements throughout all three steps of their wastewater treatment facility construction project.

This guide is to be used by the instructor as a curriculum guide in the presentation of lessons which will, provide municipal representatives with basic information that will make them aware of the need for O&M Considerations during the Construction Grants Process.

USE OF INSTRUCTOR'S MANUAL

Units

The Instructor's Manual is divided into six units which correlate to those in the Participant's Handbook, "Responsibilities to Address O&M Considerations in the Construction Grants Process EPA-430/1-80-009 May 1981". Each unit contains a variable number of lessons. For ease of access, a contents section is included at the front of the manual. All unit and lesson titles are listed in this section.

Preceding each unit is a presentation of the terminal performance objectives for that unit. These objectives specify what the participant will be able to do upon completion of the unit.

Lesson Plans

Lesson plan format includes: (1) a section on basic information---workshop name, subject and lesson title; (2) a statement of the performance objective(s) for the specific lesson; (3) lesson preparation---an introductory statement which motivates the student and lays the foundation for the information to follow; (4) lesson presentation---the stage of the lesson which provides basic information or key points relevant to the lesson topic. The basic steps in the lesson are presented on the left side of the page while key points are enumerated on the right side of the page.

The purpose of the lesson plan is to provide an outline of information for use by the instructor. The plans can be modified as desired to meet the individual instructor's needs. The lesson plan forms the basic framework of the lesson itself.

A key to the use of visuals and information sheets is provided in the lesson plan. The instructor must be familiar with this key in order to use visual aids and handouts effectively and appropriately. The O/H notation indicates the use of the transparency on the overhead projector; I/S indicates the use of related information sheets, found in participants handbook. These notations appear on the left side of the page.

Additional information which requires special emphasis (i.e., safety precautions, etc.) is referenced in a section called "Notes".

Participant Activities

Included in the Instructor's Manual are various participant activities. Examples of these activities are:

(1) A slide-tape presentation of a simulated preapplication conference which integrates class discussion and questions. (The slide-tape presentation is stopped periodically at designated points to allow for class participation.)

(2) Ongoing class discussion relevant to lesson presentations.

GUIDE TO INSTRUCTING

Four-Stage Lesson Plan

This course is designed to be presented by utilizing a modified four stage plan of instruction. This plan includes the preparation and presentation stages with optional uses of the application and verification stages. The type of application/verification, dependent upon time and audience, will be left to the discretion of the presenter. Reviews and summaries will be given verbally during or at the end of the lesson when deemed necessary.

Each lesson contains a preparation section to guide the instructor in motivating the participants. This section can be expanded upon or otherwise altered to suit the needs of the specific workshop. The preparation stage prepares the participant for the lesson. It can involve: stating the general subject of the lesson, relating the lesson to preceding or succeeding lessons, explaining the objective of the lesson (i.e., what the participant will know or be able to do at the end of the lesson), explaining why the information is important and how it will be used, and asking questions to determine the participant's knowledge of the lesson and to arouse their interest.

The presentation stage involves presenting relevant information to the participant. A combination of teaching methods, materials, and aids have been used in the prepared lesson plans. These should be followed as closely as possible. Basic rules to be followed in the presentation stage include:

1. Stress key points
2. Teach short segments of information
3. Use simple language
4. Explain, define, and pronounce new terms
5. Ask questions to increase student participation and understanding of each step or topic; state reasons for procedures or processes

The instructor must provide opportunities throughout the lesson for participants to apply what they are learning. The application stage provides these opportunities through allowing the participant to "try out" the performance or give back the information (either formally or informally). This stage involves:

1. Learner performance of the task or application of the information
2. Supervision of performance
3. The use of questions (the instructor stops periodically to check on the participant's understanding of specific concepts or ideas)
4. Repetition of the presentation if necessary
5. Immediate correction of errors or omissions (i.e., corrective feedback; compliment before you correct)
6. Avoidance of criticism
7. Allowing learners to correct their own errors when possible
8. Avoiding correction in front of others
9. Encouraging the learner
10. Continued application until certain the learner knows the material
11. Encouraging questions

It is the instructor's responsibility to evaluate participant's learning on an ongoing basis.

The verification or evaluation stage provides a specific checkpoint to see if the learner has acquired the necessary skills or information. Basic rules of evaluation include:

1. Testing only for the information taught in the lessons
2. Putting the learners on their own in performing the task or applying the information
3. Checking performance frequently
4. Directing the learner to teach another student
5. Using oral questions or written exercies
6. Checking exercises immediately
7. Letting the learners know how they are doing
8. Reteaching if necessary

A brief summary or review may be presented in each of the lesson plans. This summary/review can be modified to meet the individual instructor's needs. The summary/review provides an opportunity for review of important points at any time during the presentation. The instructor can have the student summarize important procedural steps or emphasize key points.

Visual Aids

The use of slides and/or transparencies is integrated into each lesson. The effective use of these aids will enhance class presentations and facilitate learning. The instructor must be familiar with and able to operate efficiently an overhead projector and a slide projector.

Slides and transparencies provide an excellent medium for improving communication. Used appropriately, they promote attention, create interest, center attention on the teaching topic, emphasize important concepts, utilize several physical senses, and increase understanding. Both slides and trans-

parencies are used to introduce topics and emphasize. It is important to control projection time on individual slides and transparencies. The projector should be turned off during periods of extended instruction or discussion. This directs the attention of the class to the instructor rather than dividing it between the screen and the instructor.

Projector equipment should be set up and checked for performance prior to class. Spare bulbs, extension cords, and elctrical adaptors should be readily available.

Information Sheets

Information sheets in the participants handbook provide added instruction in specific areas. These handouts are used in the lessons:

1. To present new information not treated in the basic references used in the course.
2. To elaborate information not fully treated in basic references
3. To condense information treated too fully for a particular use
4. To consolidate various items of information collected from several sources
5. To adapt printed information to the level of the learner
6. To make specific applications or to make analogies of items of information

Participant's Handbook

Each participant will be given a Participant's Handbook. This handbook is designed:

1. To supplement workshop activities
2. To facilitate understanding of materials covered in class
3. As a postcourse reference

Units in the Participant's Handbook correlate to those in the Instructor's Manual.

Reference to the handbook during class presentations will facilitate learning and aid the participant in becoming familiar with the primary workshop reference.

WORKSHOP INTRODUCTION

UNIT 1

UNIT ONE

OBJECTIVES

Following the Unit One presentation, the participant will be able to:

1. Discuss the objectives of the workshop.
2. Identify the Operation and Maintenance requirements in the Construction Grants Process.
3. Discuss section 205(g) of PL 92-500 (State Delegation).

COURSE: Responsibilities to Address O&M Considerations in the Construction Grants Process

UNIT: One

SUBJECT: Workshop Introduction

LESSON: Workshop Objectives

MATERIALS:

Overhead projector, screen — Transparencies 1-6
Chalkboard

REFERENCE: Participant Handbook, pages 1-2 to 1-5

PERFORMANCE OBJECTIVE:

The participant will be able to discuss the objectives of the workshop.

PREPARATION: (O/H-#1) and (O/H-#2) (Communication is important)

You probably have some ideas about this workshop, but at the same time you are wondering about what will be expected. In this lesson you will learn what is expected of you and what you may expect to learn. One of today's primary problems is water pollution. You, as city officials, must become familiar with the problems that can be encountered during the Construction Grants Process. Primarily, your concern is the cost to your community. That is the basis of this workshop: to give you an idea as to what it means to have a plant.

PRESENTATION:	
A. BACKGROUND	1. THE FEDERAL WATER POLLUTION ACT, AS AMENDED, PROVIDES EXTENSIVE INVOLVEMENT AND SUPPORT BY THE FEDERAL GOVERNMENT IN CONTROLLING POINT SOURCE POLLUTION
	2. THE ENVIRONMENTAL PROTECTION AGENCY IS RESPONSIBLE FOR IMPLEMENTING LAWS
(O/H-#3)	3. PROBLEM
	A. 25 YEARS OF EFFORT
	B. 20 BILLION DOLLARS IN FEDERAL FUNDS SPENT IN CONSTRUCTING WASTEWATER TREATMENT FACILITIES
(NOTE)	THIS DOES NOT INCLUDE "LOCAL FUNDS" SPENT
(O/H-#4)	C. EVIDENCE SHOWS THAT OVER 50% OF THESE ARE NOT OPERATING IN ACCORDANCE WITH THEIR ORIGINAL DESIGN OBJECTIVES
B. WORKSHOP OBJECTIVES	1. TO EMPHASIZE THE IMPORTANCE OF CONSIDERING O&M IN EACH OF THE THREE STEPS OF THE CONSTRUCTION GRANTS PROCESS

	2. To inform Step 1 grantee and priority list personnel of the O&M requirements of the Construction Grants Process
C. Slide/Tape Presentation (O/H-#5)	1. "A Rose By Any Other Name Would Smell_____"
	2. Purpose is to emphasize the need of cooperation and understanding by all persons involved in the Construction Grants Process
(O/H-#6)	3. Discussion topics: A. Individual city representation at Preapplication Conference B. Qualification of A/E firm C. Operator training D. I/I analysis and sewer systems evaluation survey E. Regional concept F. Types of waste treatment management facilities G. Primary and secondary environmental impacts
	4. (Show and discuss slide/tape presentation)

TOPIC: SLIDE/TAPE PRESENTATION
"A ROSE BY ANY OTHER NAME WOULD SMELL_____"

TIME: 25 MINUTES PLUS TIME FOR 7 INTERMITTENT DISCUSSIONS

PURPOSE: TO EMPHASIZE THE NEED OF COOPERATION AND UNDERSTANDING BY ALL PERSONS INVOLVED IN THE CONSTRUCTION GRANTS PROCESS

LEARNING OBJECTIVES: THE PARTICIPANT WILL BE ABLE TO RECOGNIZE AND DISCUSS THE FOLLOWING:

1. THE IMPORTANCE OF THE PREAPPLICATION, PREDESIGN, AND PRECONSTRUCTION CONFERENCES
2. THE DESIRABLE QUALIFICATIONS OF THE A/E FIRM
3. THE NEED FOR OPERATOR TRAINING
4. THE NEED TO REDUCE INFILTRATION AND INFLOW IN THE COLLECTING SYSTEM
5. THE ADVANTAGES AND DISADVANTAGES OF THE REGIONAL CONCEPT
6. TO DISCUSS VARIOUS TYPES OF WASTE TRATEMENT MANAGEMENT TECHNIQUES
7. TO IDENTIFY AND DISCUSS SOME OF THE PRIMARY AND SECONDARY ENVIRONMENTAL IMPACTS OF CONSTRUCTING A WASTE WATER TREATMENT FACILITY

MATERIALS REQUIRED:

1. SLIDE SET TITLED "A ROSE BY ANY OTHER NAME WOULD SMELL_____"
2. CASSETTE TAPE WITH SAME NAME
3. A COPY OF THE SCRIPT
4. A SCREEN, 35MM SLIDE PROJECTOR, AND TAPE PLAYER WITH SLIDE ADVANCE FEATURES

METHODS OF ACCOMPLSIHING OBJECTIVES:

1. INSTRUCTOR ORIENTATION OF PARTICIPANT
   A. TELL SLIDE AND TAPE PRESENTATION TITLE
   B. EXPLAIN THE PURPOSE OF THE PRESENTATION
2. ADVANCE TO BLANK SLIDE (#2) AND START TAPE
3. AT TONES (7) STOP TAPE FOR DISCUSSION

4. OPERATE SLIDE PROJECTOR MANUALLY TO DISCUSS
   A. ADVANTAGES AND DISADVANTAGES OF INDIVIDUAL CITY REPRESENTATION AT PREAPPLICATION CONFERENCE
   B. QUALIFICATIONS OF A/E FIRM
   C. OPERATOR TRAINING
   D. INFILTRATION AND INFLOW ANALYSIS AND SEWER SYSTEM EVALUATION SURVEY
   E. ADVANTAGES AND DISADVANTAGES OF REGIONAL CONCEPT
   F. ADVANTAGES AND DISADVANTAGES OF THREE WASTE TREATMENT MANAGEMENT FACILITIES
   G. PRIMARY AND SECONDARY ENVIRONMENTAL IMPACTS
5. AFTER THE DISCUSSION AND SHOWING OF SLIDES PRETAINING TO THE DISCUSSION, START THE TAPE. (THIS PROCEDURE WILL BE REPEATED SEVEN TIMES.)
6. AT END OF VISUAL PRESENTATION, THE INSTRUCTOR WILL EMPHASIZE THE KEY POINTS COVERED IN THE PRESENTATION.

SLIDE/TAPE PRESENTATION

"A Rose By Any Other Name Would Smell ____"

for

One Day Workshop

SCRIPT for "A Rose By Any Other Name Would Smell ____" for Unit, One Lesson 1 of a one-day workshop entitled "Responsibilities to Address O&M Considerations in the Construction Grants Process."

Approximate operating time: 25 minutes plus time for seven intermittent discussions.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
1	Focus	
2	blank slide (start tape)	(NARRATOR:)
3	Title	The following one-act play is entitled "A Rose By Any Other Name Would Smell ____"
4	Purpose	This play is presented to emphasize the necessity of cooperation and understanding by all persons involved in the Construction Grants Process.
5	City Hall Chambers	The scene opens in the Anytown city hall council chambers. Grant Grantee--Mayor of Anytown, Allstate is at the podium, and the other actors are seated around the council table.
6	Grant Grantee	In the order of their appearance are: Grant Grantee, Mayor, City of Anytown, Allstate
7	Joe E. State	Joe E. State, State Construction Grant Specialist
8	E.P. Hay	E.P. Hay, Regional EPA Construction Grant Coordinator
9	P.E. "Slide Rule"	P.E. "Slide Rule" McGraw, Engineer and Consultant to the city of Anytown
10	Bill Action	Bill Action, Chief Operator of the Anytown wastewater treatment plant
11	Susie Q. Public	Susie Q. Public, citizen of Anytown, was defeated for mayor in the last election

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
		(Narrator:)
		Mayor Grantee speaks:
12	Mayor Grantee	(Grant Grantee:)
		I appreciate you folks coming out to Anytown today for this preapplication conference. Each of you are aware that the City of Anytown has not met its NPDES permit for a number of years and has been placed on the state priority list. This makes Anytown eligible to apply for a Federal Construction Grant. This preapplication conference has been called by Mr. Joe E. State, State Construction Grant Specialist, at my request. I would like for Mr. State to outline briefly the State's role in the Construction Grant program.
13	Mr. State	(Mr. State:)
		Thank you, Mayor Grantee. Normally preapplication hearings are held in the State Capitol and would include representatives from 15 to 20 cities on the priority list. Sort of a mass hearing. However, the State feels that a conference of this nature should be on an individual city basis.
14	blank slide	

(STOP TAPE:
Ask participants to list and discuss the pro's and con's of individual city representation at pre-application conference.)

Manual Slide Advance		
15	Advantages of Individual City Representation	Class discussion
Manual Slide Advance		
16	Advantages of Individual City Representation	Class discussion
Manual Slide Advance		
17	Advantages of Individual City Representation	Class discussion
Manual Slide Advance		
18	Disadvantages of Individual City Representation	Class discussion

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
START TAPE/ MANUAL SLIDE		
19	Mr. Hay	(Mr. Hay:) Mr. State, I too feel that pre-application conferences should be held on an individual basis. We are better able to communicate with the Mayor and Engineer if we know them personally. They are able to ask us questions when we meet with them on a one to one basis. Besides that I sort of enjoy getting out of the city into the country once in a while.
20	Ms. Public	(Ms. Public:) Yeah, we got a fine little town here, but it hasn't done much growing since I was defeated by Mayor Grantee in 1974. I can point with pride to the fact that our present plant was constructed during my term of office in 1934 with WPA labor. It is still a good plant if it was properly operated.
21	Mr. Action	(Mr. Action:) Ms. Public, I resent ____
22	Grant Grantee	(Grant Grantee:) Now Bill, just keep quiet. We must not wash our dirty linen in public. I would like to hear more from Mr. State about how to go about getting this grant.
23	Mr. State	(Mr. State:) Alright, lets see what the City of Anytown has done to this time and what remains to be done. You are on the State priority list, the State has completed 303e river basin studies, the 208 areawide waste treatment management plan and you have your Municipal NPDES permit.
24	Ms. Public	(Ms. Public:) You gonna have to speak my language, Mr. State. 303e, 208 and NPDES. This sounds like some sort of secret police to me.
25	Mr. Action	(Mr. Action:) Ms. Public NPDES means ____

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
26	Grant Grantee	(Grant Grantee:) Now Bill, let's let Mr. State explain what NPDES means so there will be no doubt in Ms. Public's mind.
27	Mr. State	(Mr. State:) NPDES stands for National Pollution Discharge Elimination System. This NPDES permit is based on river basin (303e) plans and determines the level of treatment required for every sewage treatment plant within each river basin within the state.
28	Grant Grantee	(Grant Grantee:) I keep hearing Bill Action talking about a 20-20 permit. Is that some sort of optical term?
29	Bill Action	(Mr. Action:) Mr. Mayor 20-20 means _____
30	Ms. Public	(Ms. Public:) Aw Bill, you don't know anything about eye doctors.
31	Mr. State	(Mr. State:) Actually people, your NPDES permit indicates that maximum milligrams per liter of BOD and total suspended solids you are allowed to discharge into the receiving stream. A 20-20 permit means you may not discharge in excess of 20 mg/1 BOD or 20 mg/1 TSS into Possum creek.
32	Grant Grantee	(Grant Grantee:) Well it seems like the City of Anytown, under my very capable leadership, has met all the requirements for a construction grant. Mr. Hay, when can we reasonably expect to receive our money?
33	Mr. Hay	(Mr. Hay:) I am sorry to disappoint you Mr. Mayor, but you've only begun on Step 1 at this point in time. Step 1 of a construction grant is the planning; Step 2 is the design of the facility and Step 3 is the Construction. You must now develop a plan of study, complete the EPA Application form, select an engineer and develop a facility plan.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
34	Grant Grantee	(Grant Grantee:) We have already selected our engineer. You all met Mr. P.E. McGraw. His friends around town call him "Slide Rule". He retired at 65 from the State Highway Department after 40 years experience building and maintaining highways in Hopkins County. He is a fine man, an elder in the church and my campaign manager for the past 6 years.
35	blank slide	

(STOP TAPE: Ask participants to discuss the qualification of this man and to give the qualification he should have.)

Manual Slide Advance

36 37	Qualification of Anytown's Engineer	Class discussion

Manual Slide Advance

38 39	Qualification Mr. McGraw Should Have	Class discussion

START TAPE/ Manual Slide Advance

40	Mr. McGraw	(Mr. McGraw:) I don't know anything about a plan or developing a facility plan. I am ready to start drawing up the plans and specifications. What is this plan of study and facility plan?
41	Mr. Hay	(Mr. Hay:) A plan of study must specify the planning area and political jurisdications involved. It must identify the entities that will conduct the planning. The plan of study will contain a brief summary of the major features of the existing wastewater systems, the nature of the problem and the tentative treatment works needs. And finally it will contain a schedule for the completion of specific tasks and an itemized description of the estimated costs for the project.
42	Mr. McGraw	(Mr. McGraw:) Mr. Hay, that sounds like six or eight months work before I get started with plans and specifications. But so long as the Federal government is paying for it I guess it's O.K.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
43	Mr. Hay	(Mr. Hay:) The preparation of a plan of study is not fundable by construction grant monies.
44	Mr. Grantee	(Mr. Grantee:) Do you mean to tell me that the City of Anytown has got to spend its own money before we get the construction grant.
45	Mr. Hay	(Mr. Hay:) That's right Mr. Grantee.
46	Ms. Public	(Ms. Public:) I knew there was a hitch somewhere. The mayor hasn't been telling the council or the citizens the truth about this deal. He hasn't told anybody much of anything about this grant except that it wasn't going to cost Anytown a thin dime.
47	Mr. Action	(Mr. Action:) I have been listening to you fellows but I haven't heard anything about operation and maintenance. Do you mean to tell me that "Slide Rule" McGraw is going to decide whether we are going to expand our present plant or build a new one? Is he going to decide what type of plant we are going to build, what it will cost and how much money to budget for operation and maintenance?
48	Mr. Hay	(Mr. Hay:) As your consultant that is correct.
49	Mr. Action	(Mr. Action:) Then the citizens of Anytown needs divine help. We need to get closer to our priest and pastors. How can he estimate O&M costs when he has never been on top a sewer plant in his life?
50	Mr. McGraw	(Mr. McGraw:) Bill, I can read books on sewage treatment processes and research records of costs for O&M nation wide and come up with some pretty good figures.
51	Mr. Action	(Mr. Action:) "Slide Rule", I have read two books on brain surgery recently. Do you think this equips me to perform operations?

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
52	Mr. Grantee	(Mr. Grantee:) Bill, don't be stupid. "Slide Rule" is one of the best highway engineers in the state, so I know he can build a sewer plant. Now Mr. Hay you mentioned that Anytown would have to prepare a facility plan. What is a facility plan and do the citizens of Anytown have to pay for that too?
53	Mr. Hay	(Mr. Hay:) After your plan of study has been approved by Mr. State's office, my office and other interested State and Regional agencies may apply for a Step 1 grant. The application must be approved by both the State and EPA. You will be notified when the application is approved. You are then ready to start preparing a facility plan. The preparing of a facility plan is eligible for federal funds.
54	Mr. Grantee	(Mr. Grantee:) I hope the facility plan isn't as complicated as the plan of study.
55	Mr. Action	(Mr. Action:) Well I hope more emphasis is placed on O&M in the facility plan than in the plan of study.
56	Ms. Public	(Ms. Public:) I hope the mayor lets the citizens of this town know what's going on.
57	Mr. Hay	(Mr. Hay:) The facility plan is much more detailed and comprehensive than the plan of study. Let me go over each phase of Step 1 facility plan with you. Feel free to comment or ask questions at any point. In preparing a facility plan the effluent limitations must be taken into consideration. The degree of treatment which must be provided by a particular treatment plan is dictated by the NPDES permit.
58	Mr. Action	(Mr. Action:) Are you saying, Mr. Hay, that if your permit calls for a 20-20 effluent you probably wouldn't have to have as sophisticated a treatment plant process as you would if your permit called for a 10-10?

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
59	Mr. Hay	(Mr. Hay:) That is true Bill. For example you might be able to do a 20-20 with a primary system and a trickling filter where you might have to have filtration or tertiary treatment to get a 10-10 effluent.
60	Mr. Action	(Mr. Action:) Would it normally cost more to operate and maintain a 10-10 tertiary plant than a trickling filter plant that was doing 20-20?
61	Mr. Hay	(Mr. Hay:) Yes, indeed. Your permit dictates the type of plant, the operational efficiency required and the cost of operation and maintenance.
62	Mr. Action	(Mr. Action:) Would it require better trained operators to operate a tertiary treatment plant turning out a 10-10 than a secondary treatment plant turning out a 20-20?
63	Mayor Grantee	(Mayor Grantee:) Bill, I wish you hadn't brought up that training bit. We sent you to a 3-day seminar down at the State University three or four years ago. We gave you $120 for expenses and you spent every nickel of it. We have always been strong on training.
64	blank slide	
(STOP TAPE: Discuss operator training. When, where, why, who, how.)		
Manual Slide Advance		
65	Operator Training	Class discussion
START TAPE/ Manual Slide Advance		
66	Mr. Hay	(Mr. Hay:) Let's continue discussing the facility plan. For projects in cities having existing sewers, it is necessary to prepare an infiltration/ inflow analysis as a part of the facility plan. This analysis determines the amount of I/I and estimates how much it would cost to remove part or all of the I/I from the system. If the amount of I/I is great it will be necessary to more accurately estimate the cost of removal by performing a sewer system evaluation survey.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
67	Mr. McGraw	(Mr. McGraw:) For the first time, Mr. Hay, I understand what you are talking about. I am used to surveying in the process of building highways. I have operated a transient for years.
68	Mayor Grantee	(Mayor Grantee:) "Slide Rule", Mr. Hay isn't talking about that kind of survey. I believe he means going from house to house asking citizens questions about their sewers. Sort of like a census taker.
69	Mr. Hay	(Mr. Hay:) No fellows, a sewer system evaluation survey will identify where the excess I/I is coming from. This is done by a physical survey of the system, smoke, air or flooding tests, selected sewer system cleaning or visual (TV) or photographic inspection of selected sewer sections. This survey identifies specific sections of the sewer system which must be grouted, sealed, lined, replaced or otherwise repaired.
70	blank slide	
(STOP TAPE: Discuss the necessity for a I/I analysis and a sewer system Evaluation Survey.)		
Manual Slide Advance		
71	Infiltration/Inflow Analysis	Class discussion
Manual Slide Advance		
72	Sewer System Evaluation Survey	Class discussion
START TAPE/ Manual Slide Advance		
73	Mayor Grantee	(Mayor Grantee:) Will the Federal government pay for all these I/I analysis and this sewer survey?
74	Mr. Hay	(Mr. Hay:) Yes. Since this is a part of the facility plan it is grant eligible. Now lets talk about how Anytown will go about determining the solution to their pollution problem. Your engineer Mr. McGraw, along with any

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
		other help he can get, must develop and evaluate all alternatives or avenues open to solve your problem.
75	Mr. McGraw	(Mr. McGraw:) Where would we start to develop and evaluate alternatives?
76	Mr. Hay	(Mr. Hay:) You would need to start with your present facilities. Ask these questions: (1) If we determine by an I/I analysis and a sewer survey that we have an excess of I/I could the present plant meet our NPDES permit if the I/I was reduced to required limits? (2) If, upon the completion of number 1, would we be able to produce an acceptalbe effluent from our present plant if it was operated and maintained properly?
77	Mr. Action	(Mr. Action:) Now look here Mr. Hay, are you saying that I am doing a poor job of operating our sewer plant. Well, now that I have been put on the spot and accused let me tell this bunch a few things. For over five years I have been asking for a little bit of laboratory equipment and supplies to run some simple quality control tests. I'm talking about a couple of Imhoff cones, a burette or two, some evaporating dishes, a dozen BOD bottles, etc. No luck. They tell me at the City Hall that the plant has run since 1934 without any lab tests so we don't need them now.
78	Mr. Grantee	(Mr. Grantee:) Now Bill _____
79	Mr. Action	(Mr. Action:) Don't, now Bill, me Mr. Mayor.—We have been understaffed down there for 30 years. Infiltration has been a problem for equally that long. I have had 20 class hours of training since I've been here. That was at the State University where professors put long chemical equations and calculus formulas on the chalkboard that "Slide Rule" couldn't understand much less a bunch of sewer plant operators. The only time Susie Q. Citizen was at the sewer plant the 16 years she was mayor was in 1970 and Mr. Mayor you have never been down there since you were elected in 1974.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
		If our facility plan, our I/I analysis and our sewer survey is dependent upon you and "Slide Rule" then we all need divine help. I will say one more thing and then I'll let you fellers have the floor. If we can reduce our I/I to a minimum, set us up a small lab for routine control tests, hire three more operators and provide training for all our operators in operations and maintenance then this plant will meet our permit. That is all I have to say.
80	Mr. Hay	(Mr. Hay:) Bill, I hope those who do the I/I analysis, the sewer system survey and the entire facility plan will draw from your many years of experience as they do their work. Now let us continue to develop our facility plan. If and when it is determined that the existing facility, even with minimum I/I and good O&M, cannot possibly meet your permit then other alternatives must be studied. The possibility of a regional solution to wastewater treatment problems should be explored. This would include interconnection of facilities, joint facilities and joint management.
81	Mr. Grantee	(Mr. Grantee:) I don't think this regional business would work in our case.
82	blank slide	

(STOP TAPE: Discuss advantages and disadvantages of the regional concept.)

Manual Slide Advance		
83	Advantages Regional Concept	Class discussion
Manual Slide Advance		
84	Disadvantages Regional Concept	Class discussion
START TAPE/ Manual Slide Advance		
85	Mr. State	(Mr. State:) Mayor Grantee, there are a number of regional systems in our state and it is working well. The regional concept has resulted in better salaries, better quality control and better operation and maintenance.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
86	Mr. Grantee	(Mr. Grantee:) Well maybe so, but Anytown and our neighboring towns have never been able to agree on anything
87	Ms. Public	(Ms. Public:) Mr. Hay, if we find we can't use our present plant and we can't make any kind of deal with our neighbors what do we do then?
88	Mr. Hay	(Mr. Hay:) What we call the best practical waste treatment technology (BPWTT) must be taken into consideration. You will have to evaluate the following three waste treatment management techniques. a) Biological or physical-chemical treatment and discharge to receiving waters b) Treatment and reuse c) Land application techniques
89	blank slide	
(STOP TAPE:)	Discuss the pro's and con's of each technique. Type of processes, etc.	
Manual Slide Advance		
90	Best Practical Waste Treatment Technology Considerations	Class discussion
Manual Slide Advance		
91	Best Practical Waste Treatment Technology Considerations	Class discussion
Manual Slide Advance		
92	Treatment and Reuse Land application Techniques	Class discussion
START TAPE: Manual Slide Advance		
93	Mr. Grantee	(Mr. Grantee:) I sure hope "Slide Rule" knows something about BPWTT because I don't.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
94	Mr. Hay	(Mr. Hay:) Alternatives must be evaluated in detail on the basis of engineering, environmental impact, cost to build, cost for O&M and ability to be implemented. This process results in the selection of the most cost effective solution to your pollution problem.
95	Mr. Action	(Mr. Action:) Are you saying that the facility plan will include an estimate of the amount of money that will eventually be spent each year for O&M, staffing, training and laboratory costs under each alternative?
96	Mr. Hay	(Mr. Hay:) Yes, this is true Bill. Incidentally the cost of operating and maintaining a plant during its life is greater than the initial cost. The citizens of Anytown need to be told, that while the Federal government will pay 75% of the cost of planning, design and construction, the cost of O&M over the life of the plant will have to be born by the citizens.
97	Mr. Action	(Mr. Action:) They also need to know that it is going to take more staff, equipment, operation, maintenance, training and salaries to operate a new system than this old Imhoff tank and trickling filter.
98	Ms. Public	(Ms. Public:) I remember Mayor Grantee telling our citizens, when he beat me in 1974, that our present plant was adequate until the year 2000.
99	Mayor Grantee	(Mayor Grantee:) Well I was basing my remarks on the advice of my campaign manager, "Slide Rule" McGraw.
100	Mr. State	(Mr. State:) I might mention that the facility plan must contain evidence that the grantee has checked with the State Historic Preservation Officer relative to any impact the proposed Project will have on historical or archaeological sites.

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
101	Mr. Hay	(Mr. Hay:) That is correct, Mr. State. I would also remind you folks that all alternatives should be evaluated for their environmental impacts. The grantee must prepare an environmental assessment as a part of the facility plan. If, after examining the EA, the EPA feels that an environmental impact statement is needed the EPA will prepare it.
102	blank slide	

(STOP TAPE: List and discuss primary and secondary environmental impacts.)

Manual Slide Advance		
103	Primary Environmental Impacts	Class discussion
Manual Slide Advance		
104	Primary Environmental Impacts (Con't.)	Class discussion
Manual Slide Advance		
105	Primary Environmental Impacts	Class discussion
Manual Slide Advance		
106	Primary Environmental Impacts	Class discussion
Manual Slide Advance		
107	Secondary Environmental Impacts	Class discussion
Manual Slide Advance		
108	Secondary Environmental Impacts (Con't.)	Class discussion
Manual Slide Advance		
109	Secondary Environmental Impacts	Class discussion
START TAPE/ Manual Slide Advance		
110	Ms. Public	(Ms. Public:) I am afraid the mayor and "Slide Rule" will keep all of this information to themselves. How can we, as citizens, know what is going on?

SLIDE NUMBER	SLIDE DESCRIPTION	TAPE SCRIPT
111	Mr. Hay	(Mr. Hay:) The facility plan must contain a summary of measures taken to provide for, encourage, and assist public participation in the plan selection. Public participation will aid the grantee in selecting a plan which will be cost effective, environmentally compati ble, and have the best chance of public acceptance. The summary must disclose the response to all alternates presented and show that these responses were incorporated into the plan.
112	Ms. Public	(Ms. Public:) How may the grantee go about getting public response?
113	Mr. Hay	(Mr. Hay:) A formal public hearing must be held prior to a plan selection. Reports, document or other data to be discussed at the hearing must be available to the public at convenient times and places at least 15 days prior to the hearing. Also, the hearing must be announced through the news media at least 30 days prior to the hearing.
114	Mayor Grantee	(Mayor Grantee:) Are there any other questions for Mr. Hay or Mr. State? I feel that I have learned a great deal as a result of this pre-application conference. I appreciate you two gentlemen coming out to Anytown and meeting with us. I also want to thank our local people for coming out and contributing to the discussion. If there are no other questions or comments we will consider this meeting adjourned.
115	blank slide STOP TAPE	

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: ONE

SUBJECT: WORKSHOP INTRODUCTION

LESSON 2: O&M REQUIREMENTS

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 7 TO 10
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 1-2 TO 1-5

PERFORMANCE OBJECTIVE:

PROPER OPERATION AND MAINTENANCE OF FEDERALLY FUNDED FACILITIES IS A LONGSTANDING PROGRAM REQUIREMENT WHICH CAN BE FOUND IN THE STATUTES, REGULATIONS, GUIDELINES, AND PROGRAM REQUIREMENTS MEMORANDA.

WHAT ARE THE O&M REQUIREMENTS?

WHAT HAPPENS IF THESE REQUIREMENTS ARE NOT MET PROPERLY?

PRESENTATION:

A. LAW REQUIREMENTS (PL 92-500 AS AMENDED) (O/H-#7)

(NOTE)

NO GRANT SHALL BE AWARDED UNLESS THE APPLICANT HAS MADE PROVISIONS FOR OPERATION AND MAINTENANCE

MUST BE CARRIED OUT IN ACCORDANCE WITH A STATE APPROVED PLAN OF OPERATION

B. Code of Federal Regulations Requirements (40 CFR Part 35)	Grantee must operate and maintain the treatment works and sewer collection systems properly and efficiently
C. Failure to Fulfill All Requirments (O/H-#8)	1. Grant may be revoked 2. Grantee may be liable for federal funds spent
D. Guidelines (O/H-#9)	1. Purposes: A. To ensure that proper O&M procedures will be followed B. To provide technical information 2. Stress: A. Reliability B. Operability C. Flexibility D. Maintainability
(Note)	May be updated as new and proven technical data is developed
E. Program Requirements Memorandum (PRM)	1. Purposes are to assure national uniformity 2. Mainly concerned with PRM 77-2 and PRM 77-3

	A. START-UP SERVICES 77-2 B. A PLAN OF OPERATION 77-3
(NOTE)	PRM'S MAY BE UPDATED OR REPLACED
F. REGIONAL POLICY AND MEMORANDUM (O/H-#10) (PROBLEMS DIFFER FROM AREA TO AREA, AND SHOULD BE DEALED WITH INDIVIDUALLY) (NOTE)	1. PURPOSES ARE TO ASSURE REGIONAL UNIFORMITY 2. POLLUTION PROBLEMS IN EACH REGION MAY DIFFER REGIONAL POLICY MAY BE UPDATED OR REPLACED

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: ONE

SUBJECT: WORKSHOP INTRODUCTION

LESSON 3: STATE DELEGATION

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARNCIES 11-12
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 1-2 TO 1-5

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS SECTION 205(G) OF PL 92-500 (STATE DELEGATION).

PREPARATION:

SECTION 205(G) OF PL 29-500 AUTHORIZES THE EPA TO DELEGATE THE ADMINISTERING SECTIONS 201, 203, 204 AND 212 OF PL 92-500 AS WELL AS 402 OR 404, AND 208(B)(4) TO THE VARIOUS STATES. WHAT DOES THIS MEAN?

PRESENTATION:	
A. 205(G) OF PL 92-500	AUTHORIZES THE DELEGATION OF AUTHORITY AND THE RESPONSIBILITIES OF ADMINISTRATING THE CONSTRUCTION GRANTS PROCESS
B. DELEGATED AUTHORITY	1. O&M MANUAL

(O/H-#11) (SHOW'S EPA DELEGATING AUTHORITY TO VARIOUS STATES)	2. START-UP SERVICES 3. PLAN OF OPERATION 4. PLANS AND SPECIFICATIONS 5. ANY OTHER ITEMS INCLUDED IN DELEGATION AGREEMENT BETWEEN THE STATES AND US EPA
C. WHY (O/H-#12)	1. TO REDUCE EPA WORKLOAD 2. TO IMPROVE REVIEW PROCESS

GRANTEE'S RESPONSIBILITIES

UNIT
2

UNIT TWO

OBJECTIVES

Following the Unit Two presentation the participant will be able to discuss the:

1. Process involved in planning an operable wastewater treatment facility.
2. NPDES system.
3. Qualifications when selecting an A/E firm.
4. Importance of conducting the preliminary investigative work correctly when developing the facility plan.
5. User charge system and its importanct in funding the O&M budget.
6. Value of onsite locally controlled inspections.
7. Various decisionmakers and their responsibilities.

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: TWO

SUBJECT: GRANTEE'S RESPONSIBILITIES

LESSON 1: OBTAINING AN OPERABLE FACILITY: THE PROCESS INVOLVED

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 13-14
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK. PAGES 2-1 TO 2-6

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE PROCESS INVOLVED IN PLANNING AN OPERABLE WASTEWATER TREATMENT FACILITY.

PREPARATION:

THE GRANTEE MAKES SEVERAL CRITICAL DECISIONS PRIOR TO AND DURING THE DESIGN, PLANNING, AND CONSTRUCTION OF A WASTEWATER TREATMENT FACILITY.

PRESENTATION:

A. STEPS TAKEN

(NOTE)

THE GRANTEE SHOULD BECOME FAMILIAR WITH WASTEWATER TREATMENT PRIOR TO STEP 1

1. A REPRESENTATIVE IS SELECTED

(O/H-#13)

2. PREAPPLICATION CONFERENCE ATTENDED

	3. Engineering firm selected
	4. Plan of study developed
	5. Facility plan developed
	6. Plans and specifications (Step 2) developed
	7. Constructions (Step 3)
(Note)	They may not always occur in this order
B. Major Facility Planning Decisions (O/H-#14)	1. Assess the current situation
	2. Assess the future situations
(When making decisions do not be vague, be precise and accurate)	3. Identify alternatives
	4. Evaluate cost-effectivness
	5. Environmental impacts Statement (EIS)
	6. Select alternative
(Note)	After alternative is selected and Step 2 application is approved, the design begins

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: TWO

SUBJECT: GRANTEE'S RESPONSIBLITIES

LESSON 2: NPDES CRITERIA ATTAINMENT: EFFLUENT LIMITATIONS

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 15-16
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 2-7 TO 2-8

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE NPDES SYSTEM.

PREPARATION: (O/H-#15)(YOUR NPDES PERMIT COMES FROM A "PHYSICAL" OF THE RECIEVING STREAM)
THE GRANTEE, IN OPERATING A FEDERALLY FUNDED WASTEWATER TREATMENT PLANT, MUST MEET CERTAIN EFFLUENT LIMITATIONS. A BETTER UNDERSTANDING OF THE NPDES SYSTEM MAY HELP THE GRANTEE IN UNDERSTANDING THE NEED OF EFFLUENT LIMITATIONS.

PRESENTATION:

A. PL 92-500 OF 1972

1. ESTABLISHED OBJECTIVES OF RESTORING AND MAINTAINING THE CHEMICAL, PHYSICAL, AND BIOLOGICAL INTEGRITY OF THE NATION'S WATER

2. ADDITIONAL INFORMATION OF NPDES CAN BE FOUND IN 40 CFR PART 125,

	CRITERIA AND STANDARDS FOR NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM
B. NPDES	1. APPLIES TO ALL MUNICIPAL AND INDUSTRIAL DISCHARGES
	2. REQUIRES PERMITS
	3. COMPLIANCE ACCOMPLISHED BY:
	A. SELF-MONITORING
	B. REVIEW OF SELF-MONITORING REPORTS
	C. FACILITY INSPECTIONS
	D. ENFORCEMENT ACTION
	4. FACTORS AFFECTING LIMITATIONS
(O/H-#16)	A. CONCENTRATION VARIABILITY
	B. TREATMENT METHODOLOGY
	C. TYPES OF WASTEWATER
	D. RECEIVING STREAM QUALITY

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: TWO

SUBJECT: GRANTEE'S RESPONSIBILITIES

LESSON 3: GRANTEE-CONSULTANT RELATIONSHIP

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCY #17
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 2-9 TO 2-10

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE QUALIFICATIONS WHEN SELECTING AN A/E FIRM.

PREPARATION: (O/H-#17) (SHOWS THAT THE GRANTEE AND CONSULTANT SHOULD HAVE A CLOSE WORKING AGREEMENT)

THE LOCAL RECIPIENT OF A STEP 1 GRANT IS RESPONSIBLE FOR PREPARING THE FACILITY PLAN AND FOR MAKING THE IMPORTANT DECISIONS CONCERNING THE COMMUNITY'S FUTURE. THE OFFICIAL GRANT APPLICANT MAY BE ONE OF THE TOWN OFFICIALS (I.E. MAYOR, CITY COUNCIL MEMBER, CITY MANAGER, CITY CLERK, ETC.).

BECAUSE CITY OFFICIALS TEND TO BE INEXPERIENCED IN SEWAGE TREATMENT QUESTIONS, THEY USUALLY HIRE AN ENGINEERING CONSULTANT FOR THE ACTUAL PREPARATION OF THE FACILITY PLAN. IN MANY INSTANCES, IMPORTANT POLITICAL DECISIONS ARE DELEGATED TO THE ENGINEER.

THE GRANTEE MUST REMEMBER THAT THESE DECISIONS WILL AFFECT THE FUTURE AND SHAPE OF ITS COMMUNITY. THEREFORE THE GRANTEE MUST EXERCISE GREAT CARE IN SELECTING AN A/E FIRM.

PRESENTATION: A. Consultant Selection (Note)	When selecting a consultant the grantee should investigate the A/E firm thoroughly Use criteria found on page 2-9 of the Participant Handbook
B. A/E Firm's Role	1. Depends upon contract A. 40 CFR 35 appendix C-1 - Required Provisions - consulting engineering agreements B. 40 CFR 35 appendix C-2 - Required Provisions - construction contracts 2. The A/E firm is responsible for producing a facility plan document that complies with all EPA and state requirements
C. Grantee's Role	1. Funding for: A. Planning B. Designing C. Construction D. O&M

(NOTE)

FUTURE COST OF MAINTAINING AND OPERATING THE SYSTEM MAY SEEM REMOTE AND OBSCURE BUT MUST BE CONSIDERED

2. THE APPLICANT SHOULD BE INVOLVED THROUGHOUT THE 3 STEPS OF THE GRANTS PROCESS TO ENSURE THAT O&M CONCERNS ARE CONSIDERED

3. RESPONSIBLE FOR MEETING ALL REQUIREMENTS OF THE CONSTRUCTION GRANTS PROCESS

COURSE: Responsibilities to Address O&M Considerations in the Construction Grants Process

UNIT: Two

SUBJECT: Grantee's Responsibilities

LESSON 4: Preliminary Investigation: Work Done Well

MATERIALS:

Overhead projector, screen — Transparency #18
Chalkboard

REFERENCE: Participant Handbook, pages 2-11 to 2-12

PERFORMANCE OBJECTIVE:

The participant will be able to explain the importance of conducting the preliminary investigative work correctly when developing the facility plan.

PREPARATION:

When developing a facility plan, the grantee's A/E firm must conduct some preliminary investigations. The flow/load must be determined as well as population (present and future), land use or zoning patterns, and effluent limitations. The type of treatment facility depends upon the influent characteristics and the effluent limitations.

PRESENTATION:	
A. Characterization of Wastes	1. Sewage Source
	A. Domestic
	B. Industrial

(NOTE)	SOURCE OF SEWAGE GREATLY AFFECTS THE DESIGN 2. SEWAGE CHARACTERISTICS MUST BE DETERMINED. FOR EXAMPLE: A. BODs B. TSS 3. FLOW (AMOUNT OF SEWAGE MUST ALSO BE DETERMINED) 4. AFTER DETERMINING PRESENT FLOW, THE FUTURE FLOW AND LOAD, BASED UPON GROWTH PROJECTION, MUST BE DETERMINED
B. GROWTH PROJECTION	MUST BE DETERMINED
C. ALTERNATIVES EVALUATED (O/H-#18) (ALL ALTERNATIVES MUST BE EVALUATED BEFORE ONE IS SELECTED)	1. A/E FIRM MUST EVALUATE: A. PRESENT SYSTEM B. ALTERNATIVE SYSTEMS 2. UPON COMPLETION OF THE INVESTIGATION AND EVALUATION OF ALTERNATIVES AN ALTERNATIVE IS SELECTED

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: TWO

SUBJECT: GRANTEE'S RESPONSIBILITIES

LESSON 5: USER CHARGE

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCY #19
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 2-15 TO 2-16

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE USER CHARGE SYSTEM AND ITS IMPORTANCE IN FUNDING THE OPERATION AND MAINTENANCE BUDGET.

PREPARATION:

75% OF THE FUNDING FOR PLANNING, DESIGNING, AND CONSTRUCTING OF A WASTEWATER TREATMENT FACILITY IS FEDERALLY FUNDED. THE GRANTEE IS RESPONSIBLE FOR THE REMAINING 25%. HOWEVER, THE GRANTEE IS RESPONSIBLE FOR 100% OF THE OPERATION AND MAINTENANCE COST.

TO ENSURE THAT THE OPERATION AND MAINTENANCE BUDGET OF THE WASTEWATER TREATMENT FACILITY IS FUNDED, THE GRANTEE MUST DEVELOP A USER CHARGE SYSTEM. FUNDS FROM THIS SYSTEM WILL BE USED FOR FUNDING FACILITY O&M.

PRESENTATION:	
A. USER CHARGE	1. MUST BE DEVELOPED BY THE APPLICANT

(O/H-#19)	2. MUST DISTRIBUTE THE O&M COST AMOUNG ALL USERS IN PROPORTION TO THEIR WASTE LOAD 3. SHOULD BRING ABOUT OPERATIONAL SELF-SUFFICIENCY 4. ALL MONIES COLLECTED SHOULD BE USED ONLY FOR THE OPERATION AND MAINTENANCE OF THE WASTEWATER TREATMENT PLANT
B. USER CHARGE MODELS	APPENDIX B OF 40 CFR 35 PROVIDES THREE MODELS FOR USER CHARGE DEVELOPMENT
(NOTE)	MAY BE FOUND ON PAGES 2-15 OF THE PARTICIPANT HANDBOOK

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: TWO

SUBJECT: GRANTEE'S RESPONSIBILITIES

LESSON 6: ONSITE LOCALLY CONTROLLED INSPECTION CAPABILITY

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 20-22
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 2-17 TO 2-19

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE VALUE OF ONSITE LOCALLY CONTROLLED INSPECTIONS.

PREPARATION: (O/H-#20) (THERE ARE SEVERAL TYPES OF INSPECTIONS CONDUCTED TO HELP ENSURE THAT AN OPERABLE FACILITY IS BUILT)
THE STATE, EPA, AND/OR ARMY CORPS OF ENGINEERS CONDUCT INTERIN AND FINAL CONSTRUCTION INSPECTIONS. HOWEVER, THE GRANTEE IS RESPONSIBLE FOR PROVIDING AND MAINTAINING COMPETENT AND ADEQUATE ENGINEERING SUPERVISION AND INSPECTION OF THE PROJECT. THIS IS USUALLY IN THE FORM OF A RESIDENT ENGINEER. THIS "ONSITE LOCALLY CONTROLLED INSPECTOR" SHOULD BE CONTROLLED BY THE GRANTEE AND NOT THE A/E FIRM.

PRESENTATION:

A. ONSITE INSPECTIONS

1. MADE TO ENSURE

   A. PROPER PROJECT MANAGEMENT

   B. PROJECT IS ON SCHEDULE

(O/H-#21)	C. CONSTRUCTED ACCORDING TO APPROVED PLANS 2. MADE DURING CONSTRUCTION AND AT COMPLETION
B. RESIDENT ENGINEER	1. RESPONSIBLE FOR AS-BUILT-DRAWINGS 2. EMPLOYED BY CONSULTING ENGINEER
C. GRANTEE INSPECTOR (O/H-#22) (THE GRANTEE'S INSPECTOR IS LIKE A POLICEMAN, GUARDING THE GRANTEE INVESTMENTS)	1. MAY BE RESIDENT ENGINEER 2. SHOULD BE ANSWERABLE TO GRANTEE NOT CONSULTANT
D. CASE HISTORY	REFER TO THE TWO CASE HISTORIES IN HANDBOOK (PAGES 2-18)

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: TWO

SUBJECT: GRANTEE'S RESPONSIBILITIES

LESSON 7: DECISIONMAKERS AND THEIR RESPONSIBILITIES

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 23-24
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 2-20 TO 2-22

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE VARIOUS DECISIONMAKERS AND THEIR RESPONSIBILITIES.

PRESENTATION:	
A. DECISIONMAKERS (O/H-#23) (DIFFERENT DECISION MAKERS ARE INVOLVED)	1. GRANTEE 2. CONSULTANT 3. CONTRACTOR 4. EPA 5. STATE
B. LOCATION OF RESPONSIBILITIES (O/H-#24)	1. 40 CFR 35.936-5 GRANTEE RESPONSIBILITIES

	2. 40 CFR 35.937 Subagreements for Architectural or Engineering Services 3. 40 CFR 35.938 Construction Contracts 4. Appendix C-1 Required Provisions - Consulting Engineering Agreements 5. Appendix C-2 Required Provisions - Construction Contracts
(Note)	Grantee should become familiar with all of these regulations
C. EPA and/or State	1. Review grantee compliance 2. Conduct inspections

OPERATIONAL CONSIDERATIONS

UNIT 3

UNIT THREE

OBJECTIVES

Following the Unit Three presentation the participant will be able to discuss:

1. Where O&M must be stressed in the preapplication conference of Step 1 of the the Construction Grants Process.
2. Where O&M must be stressed in the Plan of Study.
3. Where O&M must be stressed in the Facility Plan.
4. The O&M program requirements that must be discussed at the predesign conference.
5. The purposes of the preconstruction conference and the responsibilities of each participant of the conference.
6. Possible problems and their results if O&M is not considered in Steps 1, 2, and 3 of the Construction Grants Process.
7. The program documents that can be used in meeting the O&M requirements of the Construction Grants Process.
8. The evaluation of the O&M needs of the design of a wastewater treatment facility.

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 1: PREAPPLICATION CONFERENCE

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 25-26
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-2 TO 3-4

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS WHERE OPERATION AND MAINTENANCE MUST BE STRESSED IN THE PREAPPLICATION CONFERENCE OF STEP 1 OF THE CONSTRUCTION GRANTS PROCESS.

PREPARATION: (O/H-#25) (A PREAPPLICATION CONFERENCE)

REGARDLESS OF HOW WELL-PLANNED, WELL-DESIGNED, OR WELL-CONSTRUCTED A WASTEWATER TREATMENT PLANT MAY BE, IF IT IS NOT OPERATED AND MAINTAINED BY TRAINED PERSONNEL, IT WILL NOT PERFORM AT ITS MAXIMUM DESIGN CAPACITY.

THE APPLICANT MUST BECOME FAMILIAR WITH THE REQUIREMENTS OF THE CONSTRUCTION GRANT PROGRAM AND RECOGNIZE THE IMPORTANCE OF O&M AND THE IMPLEMENTATION OF O&M PROGRAMS AND PROCEDURES.

PRESENTATION:	
A. INTRODUCTION	1. SHOULD BE HELD

	2. Conference is used to emphasize O&M requirements and potential problems 3. Goal of conference is to produce a well-coordinated program that avoids pitfalls and delays
B. Topics To Be Discussed (O/H-#26)	1. All three steps A. In the grant process B. With special emphasis on Step 1 2. Contracts for service A. Personal B. Professional 3. Requirements A. Administrative B. Technical 4. O&M considerations

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 2: PLAN OF STUDY

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCY #27
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGE 3-4

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS WHERE OPERATION AND MAINTENANCE MUST BE STRESSED IN THE PLAN OF STUDY.

PREPARATION:

THE PLAN OF STUDY IS THE MOST IMPORTANT ELEMENT OF THE THREE-STEP CONSTRUCTION GRANTS PROGRAM.

THE PLAN OF STUDY IS THE FIRST ELEMENT IN A REQUEST FOR GRANTS ASSISTANCE IN PREPARING A FACILITY PLAN.

IT IS NOT A FACILITY PLAN, BUT RATHER IT LISTS THE REQUESTED TASKS TO BE ACCOMPLSIHED IN PREPARING A FACILITY PLAN.

PRESENTATION:

A. IMPORTANCE (O/H-#27)

(PLAN OF STUDY DEVELOPMENT)

1. LAYS GROUNDWORK FOR THE FACILITY PLAN

	2. Assures that the applicant will complete the facility in accordance with all laws and regulations
(Note)	(Plan of study is not grant fundable)
B. Contents	1. Description of proposed land area
	2. Identification of the entity or entities that will conduct the planning
	3. Tasks, schedules, and costs
	4. Significant public comments

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 3: FACILITY PLAN

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 28-29
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-4 TO 3-8

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS WHERE OPERATION AND MAINTENANCE MUST BE STRESSED IN THE FACILITY PLAN.

PREPARATION:

A FACILITY PLAN IS BEGUN AFTER THE PLAN OF STUDY HAS BEEN APPROVED AND A GRANT OFFER HAS BEEN MADE AND ACCEPTED.

AS THE PLAN DEVELOPS, IT SHOULD BE REVIEWED ON AN ONGOING BASIS TO ASSURE THAT ALL OPERATION AND MAINTENANCE REQUIREMENTS ARE BEING MET AND TO ALLOW NEEDED CHANGES TO BE MADE.

PRESENTATION:

A. CONTENTS (O/H-#28)

1. DESCRIPTION OF THE TREATMENT WORKS
2. DESCRIPTION OF THE COMPLETE WASTE TREATMENT SYSTEM

	3. Documentation of infiltration and inflow (I/I) 4. Analysis of cost-effectivenss 5. Statement of effluent limitations 6. Financial statement
B. Requirements of Environmental Assessment	1. Description of the existing environment 2. Projection of the future environment 3. Documentation 4. Evaluation of alternatives 5. Statement of environmental impact 6. Action needed to minimize adverse effects
C. Guidance For Preparing A Facility Plan (Note)	1. EPA publication 2. Format and review procedures To obtain a copy see reference section
D. Effluent Limitations	1. Determines the type of treatment needed 2. Indicates the type of plant operation and maintenance required

E. Inventory	1. Of wastewater flows and the treatment system 2. Purposes A. Data for determination of future flows B. Severity of pollution problem
F. Sewer System Evaluation	1. I/I analysis 2. Major components of existing system 3. Projection of future flows and loads
G. Alternatives to Correct the Pollution Problem	1. Use of the existing facility 2. Regional approach 3. Options 4. Evaluations of alternatives
H. Public Hearing (O/H-#29) (Need for public hearing)	1. Inputs 2. Review preliminary design 3. Notices
I. Selection of Plan	1. Environmental impact summary

2. PREPARE PRELIMINARY DESIGN

3. FINANCIAL PROGRAM

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 4: PREDESIGN CONFERENCE

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCY #30
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-8 TO 3-11

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE O&M PROGRAM REQUIREMENTS THAT MUST BE DISCUSSED AT A PREDESIGN CONFERENCE.

PREPARATION:

A PREDESIGN CONFERENCE SHOULD BE SCHEDULED UPON APPROVAL OF THE STEP 2 APPLICATION.

THIS CONFERENCE IS HELD TO ENSURE THAT PLANS AND SPECIFICATIONS ARE DEVELOPED ACCORDING TO SOUND ENGINEERING PRINCIPLES AND THAT ALL PROGRAM REQUIREMENTS ARE MET.

PRESENTATION:	
A. PREDESIGN CONFERENCE (O/H-#30)	1. SHOULD BE MANDATORY 2. SHOULD COVER ALL PROGRAM REQUIREMENTS

B. Discussion of O&M Requirements	1. Plans and specifications should stress:
	A. Flexibility
	B. Operability
	C. Maintainability
	D. Reliability
	2. Development of preliminary plan of operation
	3. Need for the emergency operating plan
	4. Budget needs for O&M
	5. Required ordinances
	6. Line item costs
(Note)	Breakdown of cost for budget control
	7. Documentation of influent characteristics (very important)
(Note)	Plant design is based upon influent characteristics and effluent limitations
	8. All O&M requirements covered at preapplication conference

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 5: PRECONSTRUCTION CONFERENCE

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 31-32
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-11 TO 3-12

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE PURPOSES OF THE PRE-CONSTRUCTION CONFERENCE AND THE RESPONSIBILITIES OF EACH PARTICIPANT OF THE CONFERENCE.

PREPARATION:

A PRECONSTRUCTION CONFERENCE SHOULD BE HELD WITH THE GRANTEE, THE GRANTEE'S CONSULTANT, THE CONTRACTORS, THE STATE, THE EPA, AND THE INSPECTOR.

THE OBJECTIVE OF THE CONFERENCE IS TO DISCUSS THE RESPONSIBILITIES OF EACH PARTICIPANT IN THE PROJECT, PLACING GREAT EMPHASIS ON THE O&M REQUIREMENTS.

PRESENTATION:

A. PURPOSES

1. DISCUSS PROGRAM REQUIREMENTS
2. INTRODUCE REQUIREMENTS TO ANY NEW PERSONNEL

	3. Discuss responsibilities of participants
B. Topics (O/H-#31)	1. Records 2. Change orders 3. Inspections 4. Grant payments 5. Operational and maintenance requirements
C. Grantee's Responsibilities (O/H-#32)	1. Compliance with all laws and ordinances 2. Submission of a preliminary plan of operation 3. Submission of a start-up proposal 4. Submission of the completion schedule for: A. Final plan of operation B. Draft O&M manual by 50% payment request C. Final O&M manual by 90% payment request D. Hiring and training of plant personnel

	5. Submission of: A. User charge system B. Industrial recovery cost system C. Sewer use ordinance 6. To provide competent and adequate engineering supervision and inspection 7. To maintain sewage treatment during construction 8. To provide ongoing protection and maintenance for equipment 9. To confirm the influent characteristics
D. Inspector/Inspections	1. Explains the who, why, what, where, when, and how of the inspection process 2. Attends the preapplication conference or reviews transcript of conference
E. Reviewer	1. Emphasizes that the treatment facility must be constructed according to approved plans and specifications 2. Explains the O&M requirements of the construction grants process

(NOTE)

ESPECIALLY THOSE OF STEP II

COURSE: Responsibilities to Address O&M Considerations in the Construction Grants Process

UNIT: Three

SUBJECT: Operational Considerations

LESSON 6: Operational Problems

MATERIALS:

Overhead projector, screen
Chalkboard

Transparencies 33-35

REFERENCE: Participant Handbook, pages 3-12 to 3-19 also 3-23 to 3-24

PERFORMANCE OBJECTIVE:

The participant will be able to discuss possible problems and their results if O&M is not considered in Steps 1, 2, and 3 of the Construction Grants Process.

PREPARATION:

Operation and maintenance of a wastewater treatment facility must be considered at all times. This is especially true when the facility is being planned, designed, and under construction.

When operation and maintenance is not considered then many O&M related problems can develop.

These problems may lead to increased costs, delays, and permit violations.

PRESENTATION:	
A. Problems (O&M problems) (O/H-#33)	1. Inadequate:

(O/H-#34) (O&M PROBLEMS)	A. FUNDING FOR O&M B. OPERATOR TRAINING C. LABORATORY FACILITY 2. STAFFING 3. DESIGN DEFICIENCIES 4. CHANGE ORDERS 5. CONSTRUCTION
B. RESULTS OF PROBLEMS	1. DELAYS IN CONSTRUCTION 2. COST OVERRUNS 3. PLANT SHUTDOWNS 4. LAWSUITS 5. FINES 6. EXTENSIVE ALTERATIONS
C. AVOID PROBLEMS (O/H-#35) (HOW TO PREVENT PROBLEMS)	1. KNOWLEDGE OF: A. WASTEWATER TREATMENT PRACTICES B. CONSTRUCTION GRANTS REQUIREMENTS 2. THINK O&M 3. WORK CLOSELY WITH A/E FIRM

4. ASK QUESTIONS AND GET ACCEPTABLE ANSWERS

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 7: PROGRAM DOCUMENTS

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCY #36
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-20 TO 3-22

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE PROGRAM DOCUMENTS THAT CAN BE USED IN MEETING THE O&M REQUIREMENTS OF THE CONSTRUCTION GRANTS PROGRAMS.

PREPARATION:

THERE ARE MANY CONSTRUCTION GRANT PROGRAM DOCUMENTS THAT HAVE BEEN DEVELOPED. THEY COME IN MANY FORMS (I.E. LAWS, REGULATIONS, GUIDELINES, TECHNICAL PUBLICATIONS, PRM'S). THESE ARE DESIGNED TO HELP THE APPLICANT IN MEETING ALL THE CONSTRUCTION GRANTS PROGRAM REQUIREMENTS.

PRESENTATION:	
A. LAWS (O/H-#36)	PL 92-500
B. REGULATIONS	40 CFR 35

C. GUIDELINES	1. FEDERAL GUIDELINES FOR DESIGN OF WASTEWATER TREATMENT FACILITIES 2. FEDERAL GUIDELINES FOR OPERATION AND MAINTENANCE OF WASTEWATER TREATMENT FACILITIES
D. PROGRAM REQUIREMENT MEMORANDUM	1. OBTAIN FROM REGIONAL EPA OFFICES 2. GIVES INFORMATION OF IMPORTANCE TO CONSTRUCTION GRANTS PROCESS
E. PUBLICATIONS	USEFUL PUBLICATIONS ARE LISTED IN THE REFERENCE SECTION OF THE HANDBOOK

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: THREE

SUBJECT: OPERATIONAL CONSIDERATIONS

LESSON 8: OPERATIONAL CONSIDERATIONS IN DESIGN

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 37-39
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-25 TO 3-28

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE EVALUATION OF THE OPERATION AND MAINTENANCE NEEDS OF THE DESIGN OF A WASTEWATER TREATMENT FACILITY.

PREPARATION:

THE DESIGN OF A WASTEWATER TREATMENT FACILITY SETS THE STAGE FOR OPERATION AND MAINTENANCE. THE GRANTEE SHOULD UNDERSTAND THE RELATIONSHIP BETWEEN O&M AND DESIGN. (O/H-#37) (DESIGN & O&M GO TOGETHER)

THERE ARE MANY DESIGN CONSIDERATIONS THAT CAN AFFECT O&M. THE GRANTEE SHOULD BECOME FAMILIAR WITH THESE. THIS WILL ENABLE THE REVIEWER TO PERFORM A MORE EFFECTIVE REVIEW.

PRESENTATION:

A. DESIGN CONSIDERATIONS	1. PLANT
(O/H-#38)	2. INFLUENT CHARACTERISTICS

	3. Plant size 4. Plant layout 5. Climate 6. Materials handling 7. Hydraulic arrangement 8. Equipment selection 9. Safety
B. Design Concepts (O/H-#39)	1. Should exhibit: A. Flexibility B. Operability C. Maintainability D. Reliability E. Durability F. Economy 2. The above will improve O&M of the facility

PLAN OF OPERATION

UNIT 4

UNIT FOUR

OBJECTIVES

Following the Unit Four presentation the participant will be able to discuss the:

1. Plan of operation for program requirement compliance.
2. Monitoring of the A/E firm to ensure that specified tasks are completed at proper times.

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: FOUR

SUBJECT: PLAN OF OPERATION

LESSON 1: REQUIREMENTS AND CONTENTS

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 40-47
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 3-25 TO 3-28

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE PLAN OF OPERATION FOR PROGRAM REQUIREMENT COMPLIANCE.

PREPARATION:

A PLAN OF OPERATION IS REQUIRED FOR ALL FEDERALLY FUNDED WASTEWATER TREATMENT FACILITIES.

(O/H-#40) (INTRODUCE PLAN OF OPERATION)

THIS PLAN OF OPERATION IS A SCHEDULE OF THE STEPS AND ACTIONS TO BE PERFORMED AT A LATER DATE TO ENSURE COST-EFFECTIVE, EFFICIENT, AND RELIABLE START-UP AND CONTINUED OPERATION AND MAINTENANCE OF A WASTEWATER FACILITY.

PRESENTATION:	
A. REQUIREMENTS (O/H-#41)	1. PL 92-500 AND 40 CFR 35

	2. PRM 77-3 CONTAINS THE REQUIRED INFORMATION FOR PLAN OF OPERATION
B. PRM 77-3, PLAN OF OPERATION (O/H-#42)	1. GUIDE TO ASSIST IN THE DEVELOPMENT OF A PLAN OF OPERATION (MINIMUM REQUIREMENTS)
	2. SCHEDULE OF STEPS AND ACTIONS
	3. TELLS PURPOSE, LOCATIONS, TIME FRAME, AND HOW AND WHO WILL PERFORM EACH TASK
(O/H-#43)	4. GENERAL AREAS A. ADMINISTRATION B. TRAINING C. START-UP DEVELOPMENT D. O&M MANUAL REVISION
(O/H-#44)	5. EARLY DEVELOPMENT A. STEP 1 1) STAFFING AND TRAINING 2) ORGANIZATIONAL STRUCTURE B. STEPS 2 REQUIRES A PRELIMINARY PLAN
C. ELEMENTS OF PLAN OF OPERATION (O/H-#45)	1. DETAILED INFORMATION OF THESE ELEMENTS MAY BE FOUND IN FEDERAL GUIDELINES OPERATION AND MAINTE-

	NANCE OF WASTEWATER TREATMENT FACILITIES, AUGUST 1974
(O/H-#46)	2. IMPLEMENTATION DATES MAY BE BASED ON PERCENTAGES OF CONSTRUCTION DATES
E. FINAL PLAN OF OPERATION	1. MUST CONTAIN A CHRONOLOGICAL SUMMARY OF IMPLEMENTATION DATES
(O/H-#47)	2. MUST CONTAIN SCHEDULE AND IMPLEMENTATION DATES ON THE ELEMENTS OF THE PLANS OF OPERATION
(NOTE)	GRANTEE MUST PROVIDE PROOF OF IMPLEMENTATION OF PLAN OF OPERATION
F. CHECKLIST	SHOULD BE USED TO EVALUATE THE PLAN OF OPERATION
G. EXAMPLE	SEE PAGES 4-20 TO 4-31 BRIEFLY REVIEW EXAMPLE

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: FOUR

SUBJECT: PLAN OF OPERATION

LESSON 2: MONITORING CONSULTANT'S ACTIVITIES

MATERIALS:

OVERHEAD PROJECTOR, SCREEN
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 4-1 TO 4-31

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE MONITORING OF THE A/E FIRM TO ENSURE THAT SPECIFIED TASKS ARE COMPLETED AT PROPER TIMES.

PREPARATION:

THE GRANTEE SHOULD BE AWARE OF THE CONSULTANT'S ACTIVITIES AT ALL TIMES. THE TIMELY COMPLETION OF THE VARIOUS ELEMENTS OF THE PLAN OF OPERATION IS THE RESPONSIBILITY OF THE A/E FIRM.

PRESENTATION:	
A. PLAN OF OPERATION	USED TO MONITOR THE A/E ACTIVITIES IN MEETING IMPLEMENTATION DATES
B. PRM 77-3	1. MONITOR CONSULTANT'S ACTIVITIES 2. USE AS PAYMENT SCHEDULE

(NOTE)

3. IF CONSULTANT IS NOT FULFILLING PLAN OF OPERATION THEN PAYMENTS CAN BE WITHHELD

ELEMENTS OF A GOOD O&M MANUAL

UNIT 5

UNIT FIVE

OBJECTIVES

Following the Unit Five presentation, the participant will be able to discuss the:

1. Purposes for preparing an O&M manual.
2. Relationship of the O&M manual and the operator's needs.
3. Contents of an O&M manual.

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: FIVE

SUBJECT: ELEMENTS OF A GOOD O&M MANUAL

LESSON 1: DEVELOPMENT AND PREPARATION

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 48 TO 52
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 5-2 TO 5-9

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE PURPOSES FOR PREPARING AN O&M MANUAL.

PREPARATION:

ALL WASTEWATER TREATMENT PLANTS CONSTRUCTED WITH FEDERAL GRANT FUNDS MUST HAVE AN APPROVED O&M MANUAL.

(O/H-#48) (INTRODUCE O&M MANUAL)

BY ANSWERING THE FOLLOWING QUESTIONS, WE CAN DETERMINE WHY AN O&M MANUAL MUST BE PREPARED:

1. WHAT IS IT?
2. WHAT ARE ITS PURPOSES?
3. WHO NEEDS IT?
4. WHEN SHOULD IT BE PREPARED?
5. WHO PREPARES IT?

PRESENTATION: A. WHAT IS IT? (O/H-#49)	1. A BOOK THAT PROVIDES NECESSARY INSTRUCTION TO OPERATING PERSONNEL A. RESPONSIBILITIES B. DUTIES 2. MUST EXPLAIN REASON FOR THE SYSTEM A. DESIGNER OBJECTIVES B. IDENTIFY EACH UNIT AND ITS FUNCTION
B. PURPOSE OF MANUAL (NOTE)	1. AS A REFERENCE MANUAL A. PLANT O&M PERSONNEL B. KEEP PLANT OPERATING EFFICIENTLY 2. TRAINING MANUAL TO FIT OPERATOR'S NEEDS 3. TO HELP UNDERSTAND THE PLANTS AND SPECIFICATIONS 4. USED AS A DESIGN TOOL
C. WHO NEEDS IT? (O/H-#50)	1. FACILTIY OWNER

(O/H-#51)	2. Plant superintendent 3. Contractor 4. Resident engineer 5. State and federal agencies 6. Reviewer 7. Design engineer
D. When Should It Be Prepared?	1. Early 2. At same time the facility plan is being developed 3. No later than the preparation of the plans and specifications 4. Should be completed prior to construction phase
E. Who Prepares It?	1. Best qualified personnel 2. Design engineer should prepare the overview portions of the manual 3. Resident engineer should ensure that the manual reflects "as-built" conditions of the facility 4. Plant superintendent should proofread the manual to ensure readability

	5. Operator should review it
F. Review (O/H-#52)	1. All persons involved in the use of the O&M manual should review it for: A. Style B. Format C. Usability D. Contents 2. Refer to checklist on page 5-24 of the Participant Handbook

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: FIVE

SUBJECT: ELEMENTS OF A GOOD O&M MANUAL

LESSON 2: O&M MANUAL AND THE OPERATOR

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 53-57
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 5-10 TO 5-22

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE RELATIONSHIP OF THE O&M MANUAL AND THE OPERATOR'S NEEDS.

PREPARATION: (O/H-#53) (A MANUAL SHOULD MET OPERATOR NEEDS)

THE PREPARATION OF THE O&M MANUAL IS VERY IMPORTANT. EPA HAS EXERTED A LOT OF EFFORT ON HOW AN O&M MANUAL SHOULD BE PREPARED.

THE AUTHOR MUST CONSIDER THE AUDIENCE AND THEIR NEEDS. THE OPERATOR MUST BE CONSIDERED AS PART OF THE AUDIENCE.

THE OPERATOR'S NEEDS MUST BE MET IF THE O&M MANUAL IS TO BE USED BY THE OPERATOR.

PRESENTATION:

A. FORMAT

(O/H-#54)

(O&M MANUAL SHOULD BE IN SECTIONS)

1. MANUAL SHOULD BE DIVIDED INTO FOUR SECTIONS:

   A. ADMINISTRATIVE

	B. Plant operation 1) Description 2) Procedures 3) Personnel requirements C. Plant maintenance
(Note)	Style, language, and format must be geared to maintenance personnel
	D. Laboratory procedures 2. Additional operator needs A. Simplified diagrams B. Flow diagrams C. Manufacturers' maintenance schedules D. Detailed safety program
B. Operator Problems With the O&M Manual (O/H-#55)	1. Lack of necessary data in content 2. Manual presentation A. Language B. Too much theory C. Poor style and format D. Lengthy E. Lack of availability

C. Solutions to Problems

(O/H-#56)
(Simple language)

(O/H-#57)

1. Identify O&M manual user
2. Language should be:
   A. Simple
   B. Clear
   C. Instructive
3. Use step-by-step instruction
4. Manual must be written for a specific facility
5. Manual must be short and to the point and properly indexed
6. Operator must have own copy or a pocket version of needed sections
7. Use illustrations
8. Define technical vocabulary

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: FIVE

SUBJECT: ELEMENTS OF A GOOD O&M MANUAL

LESSON 3: CONTENTS

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCY #58
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 5-24 TO 5-32

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE CONTENTS OF AN O&M MANUAL.

PREPARATION:

THE MANUAL SHOULD CONTAIN USEFUL INFORMATION FOR THE OPERATION AND MAINTENANCE PERSONNEL. IT SHOULD TELL THEM HOW TO OPERATE AND MAINTAIN THE FACILITY.

PRESENTATION:

A. INTRODUCTION
(O/H-#58)

1. SHOULD PRESENT BROAD CONCEPTS OF THE TREATMENT SYSTEM
2. INTRODUCES THE TREATMENT PLANT'S OVERALL PERFORMANCE OBJECTIVES
3. INCLUDE OPERATOR'S GOAL AND RESPONSIBLITIES

B. Permits and Standards Section	1. Convey importance of A. Plant operation and maintenance staff B. Need for continuous training 2. Explanation of each process unit
C. Description of the Operation and Control	1. Describes operational procedures in detail 2. Describes characteristics of a properly operating system 3. Includes section on troubleshooting
D. Laboratory Testing Section	1. Laboratory needs 2. Personnel requirements 3. Types of programs
E. Records Section	Records that are kept depend upon O&M requirements and legal requirements
F. Maintenance Management Section	1. Explains benefits of program 2. Should include a maintenance checklist

G. Utilities Section	1. Discuss complete system 2. Emergency or alternate utilities need to be: A. Identified B. Located
H. Safety	1. Emphasis on effective safety program 2. Establishes safety procedures
I. Personnel Section	1. Staffing plan 2. Organization structure
J. Emergency and Response Program	1. Emergency and response actions 2. Training programs
K. Appendices	1. Reference material 2. Detailed and complex material

START-UP SERVICES

UNIT 6

UNIT SIX

OBJECTIVES

Following the Unit Six presentation, the participant will be able to discuss the:

1. Planning, use, and need for start-up services.
2. Specific services that are eligible for grants funding.
3. Qualifications of the start-up service provider.
4. Training program outlined in a start-up service proposal.

COURSE: RESPONSIBLITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: SIX

SUBJECT: START-UP SERVICES

LESSON 1: START-UP SERVICES PLANNING, USE, AND NEEDS

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 59-62
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 6-4 TO 6-16

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE PLANNING, USE, AND NEED FOR START-UP SERVICES.

PREPARATION:

THE CONSTRUCTION GRANTS PROGRAM PROVIDES FUNDS TO PLAN, DESIGN, AND CONSTRUCT WASTEWATER TREATMENT PLANTS. THE PRIMARY FUNCTION OF WASTEWATER TREATMENT PLANTS IS TO TREAT WASTEWATER TO OBTAIN SPECIFIC CONDITIONS AND LIMITATIONS ON THE DISCHARGE PERMIT. THE KEY TO ATTAINING PLANT DESIGN CRITERIA IS SUCCESSFUL START-UP SERVICES.

(O/H-#59) (INTRODUCES START-UP SERVICES)

PRESENTATION:

A. START-UP SERVICES

(O/H-#60)

1. DEFINED AS A SERIES OF EVENTS THAT LEAD TO A STABILIZED, ROUTINELY CONTROLLED UNIT PROCESS OR PLANT

(O/H-#61)	2. INCLUDE: A. PRESTART-UP PREPARATION B. START-UP OF ALL PLANT UNITS AND/OR PROCESSES C. PRE- AND POSTSTART-UP TRAINING D. O&M MANUAL REVISION BASED UPON OPERATING EXPERIENCE
B. PLANNING	1. START-UP IS VERY COMPLEX
(NOTE)	START-UP DOES NOT JUST HAPPEN
(O/H-#62)	2. REQUIRES PLANNING, COORDINATION, AND DETAILED PREPARATION
(NOTE)	COORDINATION WITH POO IMPLEMENTATION SCHEDULE
	3. SHOULD BEGIN AS EARLY AS STEP 1
(NOTE)	NOT REQUIRED TO BE SUBMITTED UNTIL STEP 3 APPLICATION
C. NEEDS	1. PROVIDES INFORMATION ON: A. INSPECTING AND ADJUSTING EQUIPMENT PRIOR TO START-UP B. OUTLINING THE STEPS NEEDED FOR PLACING EACH UNIT OR PROCESS IN OPERATION

	2. Information should be tailored to meet the needs of each plant
D. Use	1. To achieve operational objectives quickly
(Note)	Objectives can be met with a planned and implemented start-up service plan
	2. Consideration of plant start-up is essential
	A. Assures minimum problems
	B. Provides proper framework for long term trouble-free operation
	3. To combine the entire O&M program before closing out Step 3 grant
	4. Start-up services are the means for implementing the plan of operation using the information provided in the O&M manual
	5. Training programs should:
	A. Provide broad knowledge of the facility
	1) Processes 2) Equipment 3) Instrumentation

B. PROVIDE THE ENGINEER WITH INFORMATION THAT CAN BE USED TO DEVELOP MORE EFFECTIVE O&M PROGRAMS

COURSE: RESPONSIBLITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: SIX

SUBJECT: START-UP SERVICES

LESSON 2: START-UP SERVICES FUNDING AND ELIGIBILITY

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 63-64
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 6-4 TO 6-16

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE SPECIFIC SERVICES THAT ARE ELIGIBLE FOR GRANT FUNDING.

PREPARATION:

CONSTRUCTION GRANTS PROGRAM REQUIREMENTS MEMORANDUM (PRM 77-2) IDENTIFIES SPECIFIC SERVICES RENDERED DURING START-UP AS GRANT FUNDABLE. THESE SERVICES WILL HELP ENSURE THAT THE TREATMENT FACILITY ACHIEVES OPERATIONAL OBJECTIVES RAPIDLY AND EFFECTIVELY.

PRESENTATION:

A. FUNDING AND ELIGIBILITY

(O/H-#63)

1. START-UP SERVICES SHOULD IDENTIFY AND RESOLVE PROCESS AND EQUIPMENT PROBLEMS

2. ELIGIBLE SERVICES MUST PROVIDE:

   A. TRAINING

	B. Fine tuning C. Laboratory procedures D. Maintenance management E. Records management F. O&M manual revision
B. Participation in Start-up Services (O/H-#64)	1. Proposal submitted with Step 3 application 2. A design engineer or designee must provide services 3. A certified operator should supervise services (if certification is required) 4. Proposal must contain: A. Services requested B. Course curriculum C. Training outline D. Names and qualifications of those providing services E. Number of mandays F. Cost breakdown 5. Completion within 12 months

COURSE: RESPONSIBLITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: SIX

SUBJECT: START-UP SERVICES

LESSON 3: START-UP SERVICES PROVIDER

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 65-69
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 6-4 TO 6-16

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE QUALIFICATIONS OF THE START-UP SERVICE PROVIDER.

PREPARATION:

THE START-UP SERVICE PROVIDERS SHOULD POSSESS TRAINING EXPERTISE EQUAL TO OR EXCEEDING THEIR TECHNICAL EXPERTISE. THE REVIEWER OF START-UP SERVICE PROPOSALS MUST DETERMINE IF THE PROVIDER IS QUALIFIED TO RENDER THE PROPOSED SERVICES.

(O/H-#65) (START-UP SERVICES BRING TOGETHER THE O&M PROGRAM)

PRESENTATION:

A. PRM 77-2

(O/H-#66)

1. REQUIRES A:

   A. DESIGN ENGINEER

   B. DESIGN ENGINEER DESIGNEE(S)

	2. DOES NOT ADDRESS QUALIFICATIONS OF PROVIDER
B. ENGINEER (O/H-#67)	1. MUST POSSESS TRAINING EXPERTISE 2. MUST BE ABLE TO COMMUNICATE TECHNICAL KNOWLEDGE TO OTHERS
C. DESIGNEE (O/H-#68)	1. MAY HAVE SAME TECHNICAL KNOWLEDGE AS ENGINEER 2. MUST HAVE TRAINING EXPERTISE
D. QUALIFICATIONS (O/H-#69)	1. MUST HAVE TRAINING EXPERTISE 2. MUST HAVE NECESSARY TECHNICAL KNOWLEDGE 3. MUST HAVE ADDITIONAL RESOURCES A. MANPOWER B. TECHNICAL SUPPORT

COURSE: RESPONSIBILITIES TO ADDRESS O&M CONSIDERATIONS IN THE CONSTRUCTION GRANTS PROCESS

UNIT: SIX

SUBJECT: START-UP SERVICES

LESSON 4: START-UP SERVICES TRAINING

MATERIALS:

OVERHEAD PROJECTOR, SCREEN — TRANSPARENCIES 70-77
CHALKBOARD

REFERENCE: PARTICIPANT HANDBOOK, PAGES 6-4 TO 6-16

PERFORMANCE OBJECTIVE:

THE PARTICIPANT WILL BE ABLE TO DISCUSS THE TRAINING PROGRAM OUTLINED IN A START-UP SERVICE PROPOSAL.

PREPARATION:

THE MOST IMPORTANT USE OF START-UP SERVICES IS AS A TRAINING PROGRAM. MEETING EFFLUENT PERFORMANCE IN A COST-EFFECTIVE AND TIMELY MANNER IS THE OBJECTIVE OF PLANT START-UP. SUCCESSFUL START-UP IS A MAJOR TASK WHICH REQUIRES A TRAINING PROGRAM THAT MOTIVATES PLANT PERSONNEL TO WORK TO THEIR UTMOST POTENTIAL.

(O/H-#70) (INTRODUCES START-UP TRAINING)

PRESENTATION:

A. START-UP TRAINING

1. SHOULD MOTIVATE
2. SHOULD MAKE FULL USE OF STAFF POTENTIAL

3. SHOULD COORDINATE PLANT EQUIPMENT OPERATION WITH PLANT PROCESS OPERATIONS

4. SHOULD COORDINATE ALL OTHER PHASES OF PLANT OPERATION INCLUDING:

(O/H-#71)

A. MANAGEMENT

B. MAINTENANCE

C. LABORATORY CONTROL

D. USE OF O&M MANUALS

(O/H-#72)

5. PROVIDE PRESTART-UP TRAINING IN

A. PLANT OPERATION

B. PLANT MAINTENANCE

C. PLANT SUPERVIISON AND MANAGEMENT

(O/H-#73)

6. TRAINING PROVIDED BY EQUIPMENT SUPPLIERS

A. MECHANICAL START-UP SERVICES

B. PROCESS START-UP SERVICES

C. TRAINING OF PLANT PERSONNEL

(NOTE)

THESE SERVICES SHOULD BE STATED IN TERMS OF PERSONNEL AND TIME. THE REVIEWER SHOULD LOOK FOR THESE

	REQUIREMENTS DURING PLANS AND SPECIFICATIONS REVIEW 7. SHOULD INCLUDE: A. EQUIPMENT OR INSTRUMENT CHECKLIST B. START-UP SUPERVISION C. PROCESS TUNING AND COORDINATION D. CONTRACTOR TRAINING
(NOTE)	TO OBTAIN CONTRACTOR SERVICES, THE PLANS AND SPECIFICATIONS CONTRACT, ETC., SHOULD SPECIFY WHAT IS REQUIRED
B. PREPARATION (O/H-#74) (TO BE AN EFFECTIVE TRAINER ONE MUST KNOW HIS/HER SUBJECT)	1. MUST BEGIN EARLY 2. TRAINING SCHEDULES MUST BE COORDINATED WITH O&M MANUAL DEVELOPMENT 3. TRAINING BEGINS AS SOON AS CONSTRUCTION IS COMPLETED 4. MEETING WITH PLANT STAFF MUST BE HELD TO DETERMINE THE: A. TYPE OF DELIVERY B. STYLE OF DELIVERY

C. DELIVERY (O/H-#75) (GOOD DELIVER IN TRAINING IS IMPORTANT)	1. MUST BE EASILY UNDERSTOOD BY PARTICIPANTS 2. MUST HAVE HIGHLY QUALIFIED INSTRUCTOR 3. MUST INVOLVE PARTICIPANTS 4. SHOULD INCLUDE: A. CLASSROOM TRAINING B. HANDS-ON TRAINING
D. FOLLOW-UP (O/H-#76) (O/H-#77) (PROPER START-UP AND TRAINING WILL HELP PREVENT PROBLEMS)	1. NEEDED BECAUSE: A. TURNOVER RATE IS HIGH B. SHORTAGE OF QUALIFIED OPERATORS 2. PROVIDES AN ONGOING TRAINING PROGRAM A. TO TRAIN NEW EMPLOYEES B. UPGRADE OLD EMPLOYEES